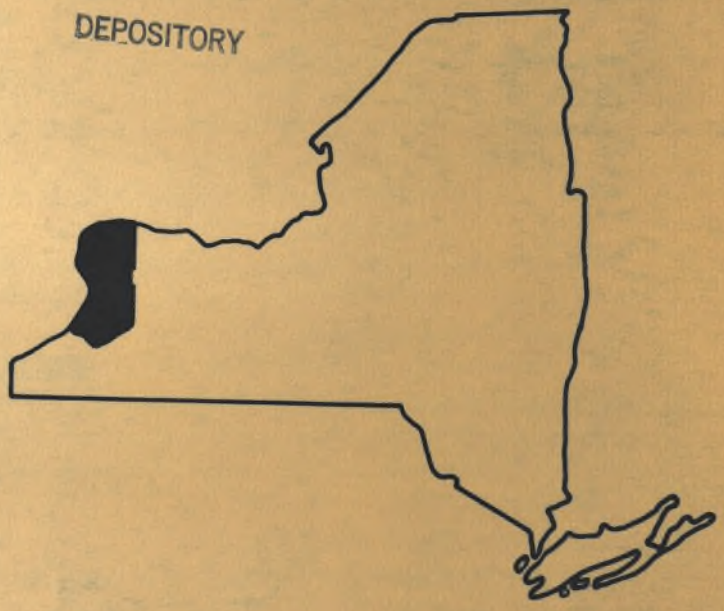
HH10.9:
W69/3

FLOOD INSURANCE STUDY

Library
Texas A&M University
FEB 21 1978
DEPOSITORY

VILLAGE OF WILSON, NEW YORK
NIAGARA COUNTY



OCTOBER 1977

U.S. DEPARTMENT of HOUSING & URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd
Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by
TEXAS A&M UNIVERSITY

Original from
TEXAS A&M UNIVERSITY

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 Purpose of Study	1
1.2 Coordination	1
1.3 Authority and Acknowledgements	2
2.0 AREA STUDIED	2
2.1 Scope of Study	2
2.2 Community Description	2
2.3 Principal Flood Problems	4
2.4 Flood Protection Measures	4
3.0 ENGINEERING METHODS	5
3.1 Hydrologic Analyses	5
3.2 Hydraulic Analyses	7
4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS	8
4.1 Flood Boundaries	8
4.2 Floodways	10
5.0 INSURANCE APPLICATION	12
5.1 Reach Determinations	12
5.2 Flood Hazard Factors	13
5.3 Flood Insurance Zones	13

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

TABLE OF CONTENTS - continued

	Page
5.4 Flood Insurance Rate Map Description	14
6.0 OTHER STUDIES	14
7.0 LOCATION OF DATA	16
8.0 BIBLIOGRAPHY AND REFERENCES	16

FIGURES

Figure 1 - Vicinity Map	3
Figure 2 - Storm Effects on Lake Water Levels	9
Figure 3 - Floodway Schematic	12

TABLES

Table 1 - Summary of Discharges	6
Table 2 - Elevation-Frequency Data - Lake Ontario	7
Table 3 - Floodway Data	11
Table 4 - Flood Insurance Zone Data	15

EXHIBITS

Exhibit 1 - Flood Profiles East Branch Twelvemile Creek	Panel 01P
Exhibit 2 - Flood Boundary and Floodway Map	Panel 360978 0001B

PUBLISHED SEPARATELY:

Flood Insurance Rate Map	Panel 360978 0001B

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

FLOOD INSURANCE STUDY
VILLAGE OF WILSON, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the Village of Wilson, Niagara County, New York, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of the information will be to convert the Village of Wilson to the regular program of flood insurance by the Federal Insurance Administration (FIA). Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

A series of meetings were held with representatives of the U. S. Geological Survey (USGS) and the U. S. Army Corps of Engineers (COE), local administrative officials, representatives of the study contractor, and other interested parties. The purposes of these meetings were to establish background information, analyze existing flood plain zoning, coordinate engineering efforts, and inform the community of study progress. A general information meeting was held on September 25, 1975, to acquaint the community with the study and how it was to be performed.

Coordination meetings included a discussion of the methodologies used for evaluating the hydrology of ungaged streams and a discussion of available gaging station records. Technical assistance was furnished by the offices of the USGS in Albany and the COE, Buffalo District.

Contact with local authorities was maintained through the offices of the village clerk and the Superintendent of Public Works for the village.

A search for available basic data was made at all levels of government. The office of the Superintendent of Public Works provided various land use, zoning, and other municipal maps of the Village of Wilson.

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

Basin hydrologic data, as well as maps of flood-prone areas, were provided by the USGS office in Albany, New York.

On January 7, 1977, the results of this study were reviewed at a final coordination meeting attended by community officials, county officials, and representatives of the FIA and the study contractor.

1.3 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by Parsons, Brinckerhoff, Quade, & Douglas under subcontract to Goodkind & O'Dea, Inc., for the Federal Insurance Administration under Contract Number H-3831. This work, which was completed in November 1976, covered all flooding sources in the Village of Wilson.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Village of Wilson. The area of study is shown on the Vicinity Map (Figure 1).

Areas studied in detail include the Lake Ontario shoreline and East Branch Twelvemile Creek from Lake Road to a point just upstream of the corporate limits.

Areas studied in detail were chosen with consideration given to forecasted development and proposed construction for the next five years (through January 1982).

2.2 Community Description

The Village of Wilson is located in northern Niagara County in the northwestern part of New York State. The village lies in the north-central part of the Town of Wilson, and is bordered on the north by Lake Ontario.

The village was incorporated in 1858 and is a predominantly single-family residential community with a corporate area of approximately

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd
Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY

Original from TEXAS A&M UNIVERSITY

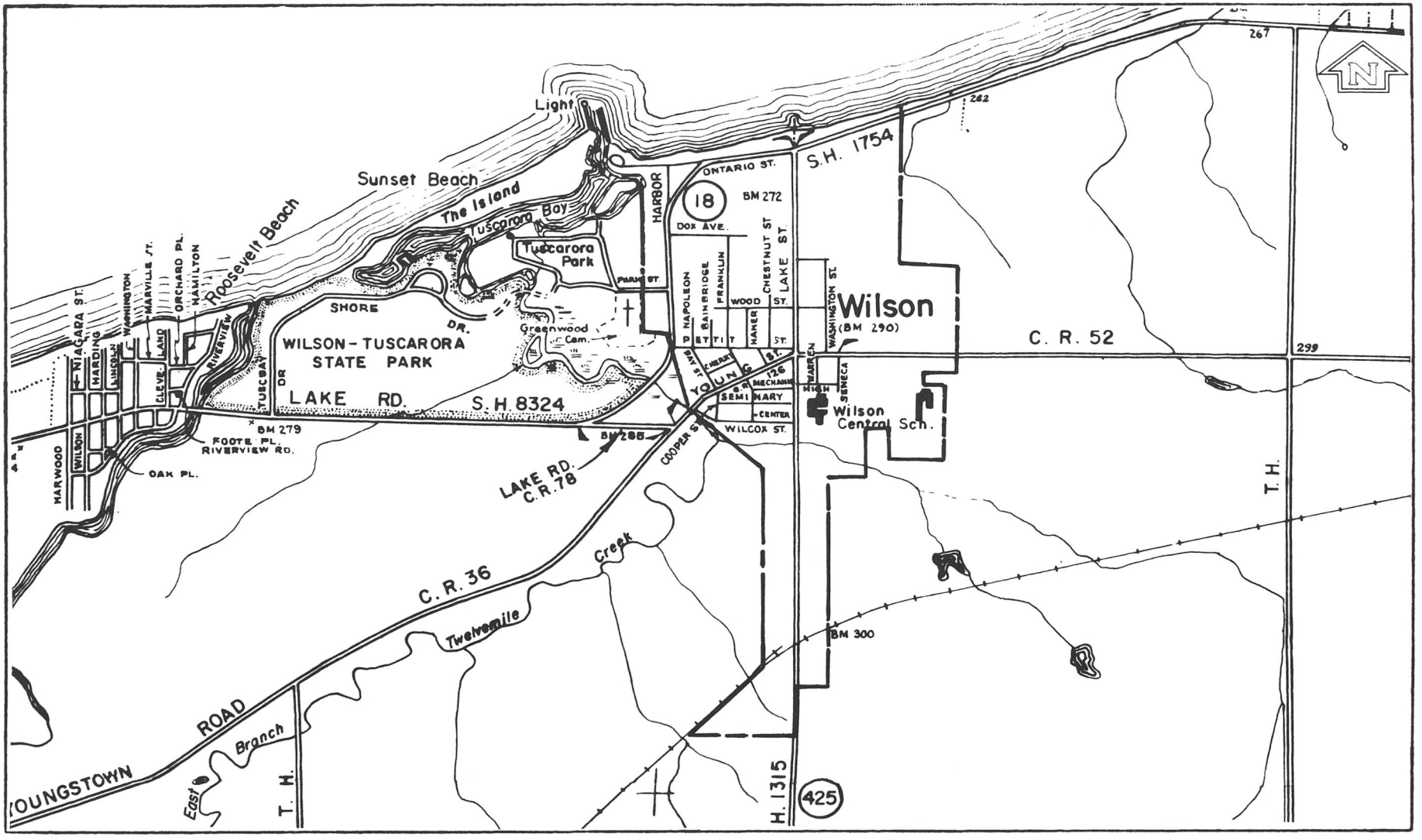


FIGURE 1

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

VILLAGE OF WILSON, NY
(NIAGARA CO.)

APPROXIMATE SCALE
0 2000 4000 6000 8000 FEET

VICINITY MAP

0.77 square mile. There is a small commercial area occupying 0.028 square mile. According to information provided by the village Superintendent of Public Works, the present population of the Village of Wilson is estimated to be 1,320 persons, with an expected increase of 180 persons by 1980.

The topography of the village is relatively flat, ranging from approximately 245 feet NGVD along Lake Ontario to 280 feet NGVD at the southern borders of the village; all elevations in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929.

East Branch Twelvemile Creek, which flows mostly through the Town of Wilson, flows along the southwestern boundaries of the village, crosses Youngstown Road and Route 18, and then flows through the Town of Wilson before emptying into Tuscarora Bay and finally Lake Ontario. The area of the village near the stream contains primarily residential development.

A moderate climate prevails, with an average annual temperature of approximately 52°F and an average annual precipitation of approximately 30 inches.

2.3 Principal Flood Problems

Flooding in the Village of Wilson occurs due to heavy rains resulting from localized thunderstorms, hurricanes, and high water levels of Lake Ontario coupled with high winds. The worst flooding and erosion occurred in March 1973 along the north side of Route 18 (Ontario Street) along the lake shore and inland along the banks of East Branch Twelvemile Creek. As a result of this flooding and erosion, there was considerable damage to property (both residential and commercial) along the lake shore. Then in July 1975, flooding occurred due to heavy rains and resulted in innundation of low-lying areas of the village. No peak flows or frequencies are available for these flood events.

2.4 Flood Protection Measures

The Village of Wilson, recognizing the need for proper flood plain management, adopted the New York State Building Code and is endeavoring to enforce it as a flood protection measure.

Since there is no major flooding problem except for the erosion along the Lake Ontario shore line whenever there are high water levels,

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

high winds, or heavy rains, there are no other major flood protection measures planned for the near future.

Outflow from Lake Ontario is regulated by a power house and dam at Barnhart Island, New York. The lake is controlled according to Plan "1958-D," a plan which tries to anticipate high and low water levels according to seasonal fluctuations (Reference 1). The plan calls for seasonal adjustments of outflow to keep the lake level from 241.31 to 244.53 above the International Great Lakes Datum (IGLD = NGVD - 1.56 feet). Large long-term fluctuations of the lake sometimes make it difficult to maintain the desired range of levels for the lake. Due to the relationship of the large lake area to the limited discharge capabilities of out-flow streams, flood levels on the lake persist for a considerable time after the factors causing the high levels have diminished.

3.0 ENGINEERING METHODS

For flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10, 50, 100, and 500 years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the drainage areas of the stream and along the coastline of Lake Ontario.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail in the community.

In this study, the peak discharge-frequency relationships of nine USGS gaging stations on Cattaraugus Creek, Eighteenmile Creek, Smoke Creek, Buffalo Creek, Little Buffalo Creek, Cayuga Creek, Cazenovia Creek, and Scajaquada Creek (References 2 and 3) were first established using the standard log-Pearson Type III method, as recommended by the Water Resources Council (Reference 4). The lengths of record of these stations range from 11 to 35 years. The longest record is available from USGS Gage 0215000-Cayuga Creek

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd
Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

near Lancaster, which has been operated since September 1938 with one year of missing flood records.

A set of regional flood-frequency curves was then established by correlating peak discharge and drainage area information for these gaging stations. The regional curves were also extended to cover watersheds with drainage areas less than 15 square miles. Since the Bureau of Public Roads method (Reference 5) is commonly used for estimating flood peaks of ungaged small watersheds in this region, this method was used to verify the validity of the extended curves. The peak discharges estimated from the extended regional curves check closely with the peak discharges estimated by the Bureau of Public Road's method.

The regional flood-frequency curves were then used to establish the discharge-frequency relationship for the stream studied in detail. The peak discharge drainage area relationships are presented in Table 1, "Summary of Discharges."

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGE (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
EAST BRANCH TWELVEMILE CREEK					
Village of Wilson	20.0	3,530	5,040	5,710	7,540

Analyses of elevations of Lake Ontario were based on records for the lake gages at Rochester (19 years), Oswego (74 years), and Cape Vincent (39 years) all on the United States side of the lake, as well as those at Port Weller (24 years) and Kingston (64 years) on the Canadian side. In 1975, the COE determined elevations for Lake Ontario based on elevation-frequency curves of the annual maximum flood levels recorded at each previously mentioned gage site, and adjusted to reflect present diversion and outlet conditions (Reference 6). The detailed investigation of the gage data included the statistical analysis of both the full record length and that portion of the record subsequent to the implementation of the most recent Great Lakes Regulation Plan. Comparison of the results of the analysis of the raw gage data with the COE analysis resulted in no significant differences, therefore, the COE 100-year flood levels were adopted for use in this study.

To establish the 10, 50, and 500 year flood elevations without the effect of wave run-up, an elevation-frequency curve was established

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

using the 100-year elevations as determined above and a weighted mean (2-year) lake elevation of 247.43 feet NGVD obtained from gage records. The elevations of floods of the selected recurrence intervals are presented in Table 2, "Elevation-Frequency Data-Lake Ontario."

TABLE 2 - ELEVATION-FREQUENCY DATA - LAKE ONTARIO

	STILL-WATER ELEVATION (FT NGVD)			
LOCATION	10-YEAR	50-YEAR	100-YEAR	500-YEAR
Entire shoreline of Village	248.3	248.8	249.0	249.4

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding sources studied in detail in the community were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along the stream and shoreline areas studied in detail.

Cross section data for the stream in the study area were obtained from aerial photographs; the below water sections were obtained by field measurement. All bridges and culverts were field surveyed to obtain elevation data and structural geometry. Cross sections were located at close intervals upstream and downstream of bridges and culverts in order to compute significant backwater effects of these structures. In addition, cross sections were taken between hydraulic controls wherever warranted by topographic changes. The locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Roughness coefficients (Manning's "n") for the computations were estimated on the basis of field inspection of channel and overbank areas. For East Branch Twelvemile Creek the roughness coefficient used was 0.04 for the channel, with a Manning's "n" of 0.15 for the overbank areas.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1). Water-surface elevations of floods of the selected recurrence intervals were developed using the COE HEC-2 computer step-backwater model (Reference 7). The starting water-surface elevation for East Branch Twelvemile Creek was based upon

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

a 2-year flood frequency level of Lake Ontario. All elevations are referenced to NGVD; elevation reference marks used in this study are shown on the maps.

The ultimate water levels for Lake Ontario were determined by adding the dynamic effect of wave run-up to the storm water levels determined above and shown in Figure 2 (refer to Figure 2 for illustration of storm effects on lake water levels). The magnitude of wave run-up was determined by using a method based on the COE Shore Protection Manual (Reference 8). This method considered wind direction and speed, open water distance, near shore slope and its variation, and water depth at representative shoreline cross sections. Base flood elevations shown on the Flood Insurance Rate Map for Tuscarora Bay and the downstream portions of East Branch Twelvemile Creek reflect the still-water storm elevations on Lake Ontario, since shoreline topography in this area prevents the higher elevations caused by wave run-up.

Flood elevations in the town may be raised by debris blockage or ice jams during spring thaws; the hydraulic analyses for this study, however, are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are thus considered valid only if hydraulic structures in general remain unobstructed and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management programs. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1"=200', with a contour interval of five feet (Reference 9). In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd
Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

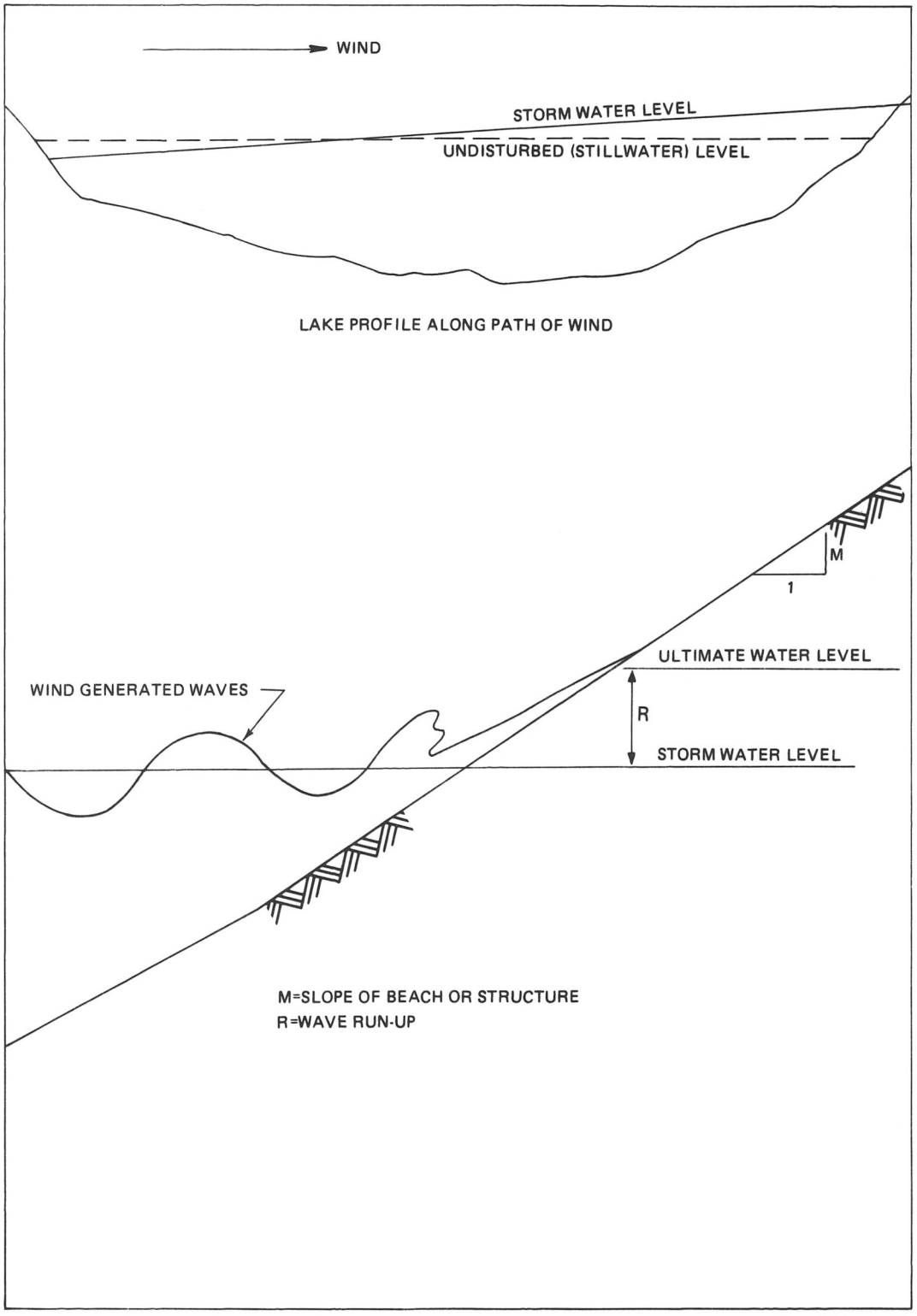


FIGURE 2

DIAGRAM OF STORM EFFECTS ON LAKE WATER LEVELS

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by
TEXAS A&M UNIVERSITY

Original from
TEXAS A&M UNIVERSITY

Flood boundaries along the Lake Ontario shoreline were determined using the detailed topographic maps referenced above.

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations, and therefore, not be subject to flooding; owing to limitations of the map scale, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodway in this report is presented to local agencies as a minimum standard that can be adopted or that can be used as a basis for additional studies.

The floodway presented in this study was computed on the basis of equal conveyance reduction from each side of the flood plain. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway was computed (Table 3).

As shown on the Flood Boundary and Floodway Map (Exhibit 2) the floodway widths were determined at cross sections; between cross sections, widths were interpolated and boundaries drawn. In cases where the floodway and the 100-year boundaries are close together, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 3.

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY

Original from TEXAS A&M UNIVERSITY

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION[3]		
CROSS SECTION	DISTANCE[1]	WIDTH[2] (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	WITH FLOODWAY (NGVD)	WITHOUT FLOODWAY (NGVD)	DIFFERENCE (FT.)
East Branch Twelvemile Creek							
A	7,620	292	2,362	2.4	257.4	257.4	0.0
B	7,950	250	1,845	3.1	257.6	257.6	0.0
C	8,235	100	856	6.7	257.9	257.8	0.1
D	8,380	98	785	7.3	259.3	259.3	0.0

[1]FEET ABOVE MOUTH
[2]THIS WIDTH EXTENDS BEYOND THE CORPORATE LIMITS
[3]WATER-SURFACE ELEVATIONS WITHOUT CONSIDERING ICE JAM EFFECTS

TABLE 3

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

VILLAGE OF WILSON, NY
(NIAGARA CO.)

FLOODWAY DATA

EAST BRANCH TWELVEMILE CREEK

Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevation for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Village of Wilson is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

In 1975 the COE published 100-year flood elevations for the Lake Ontario shoreline (Reference 6). These elevations were based on a statistical analysis of gage levels adjusted to reflect present diversion and outlet conditions. Comparison of the results of this study's analysis of the raw gage data with the flood levels presented by the COE resulted in no significant differences; therefore, the 100-year open-coast flood levels developed by the COE were adopted for use in this study.

This study is fully coordinated with the Flood Insurance Study for the Town of Wilson.

This study is authoritative for the purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY

Original from TEXAS A&M UNIVERSITY

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3]
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
East Branch Twelvemile Creek Reach 1	01	-1.63	-0.46	1.17	015	A3	Varies
Lake Ontario Reach 1	01	-0.7	-0.2	0.4	005	A1	Varies

[1] FLOOD INSURANCE RATE MAP PANEL
[2] WEIGHTED AVERAGE
[3] ROUNDED TO NEAREST FOOT – SEE MAP

TABLE 4

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

VILLAGE OF WILSON, NY
(NIAGARA CO.)

FLOOD INSURANCE ZONE DATA

EAST BRANCH TWELVEMILE CREEK AND LAKE ONTARIO

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the office of the Federal Insurance Administration, Regional Director, 26 Federal Plaza, New York, New York 10007.

8.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Army Corps of Engineers, Regulation of Lake Superior and Ontario, Plan SO-901, Detroit, September 1974.

2. U. S. Department of the Interior, Geological Survey, Geological Survey Water Supply Paper 1677, Magnitude and Frequency of Floods in the United States, Part 4, St. Lawrence River Basin, by Richard H. Tice, 1968.

3. U. S. Department of the Interior, Geological Survey, Water Resources Data for New York, Part 1, Surface Water Records, 1963 through 1973.

4. Water Resources Council, "A Uniform Technique for Determining Flood Flow Frequencies," Bulletin 15, December 1967.

5. U. S. Department of Commerce, Bureau of Public Roads, Estimating Peak Rates of Runoff from Small Watersheds in portions of New York, Hydraulic Engineering Circular No. 4, November 1963.

6. U. S. Army Corps of Engineers, Great Lakes 100-Year Open Coast Flood Levels, Volumes 1 and 2, December 1974 and October 1975.

7. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, October 1973.

8. U.S. Army Corps of Engineers, Shore Protection Manual, Volumes I, II and III, Fort Belvoir, Virginia, 1973.

9. Quinn and Associates, Unpublished cross-section data and topographic maps for the Town of Wilson, New York, 1975.

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

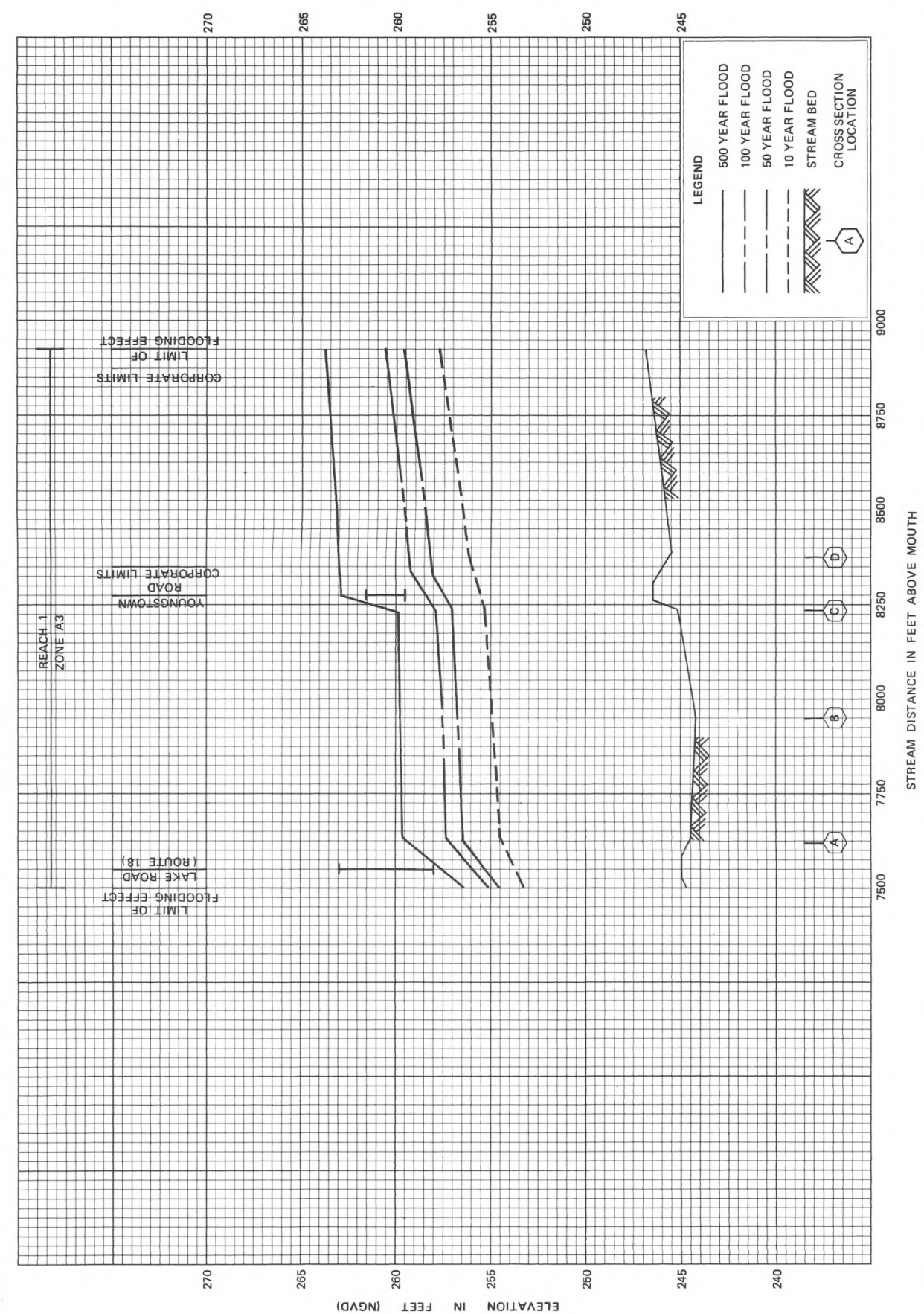
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

VILLAGE OF WILSON, NY
(NIAGARA CO.)

01P

FLOOD PROFILES

EAST BRANCH TWELVEMILE CREEK



Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd
Digitized by TEXAS A&M UNIVERSITY
Original from TEXAS A&M UNIVERSITY

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by
TEXAS A&M UNIVERSITY

Original from
TEXAS A&M UNIVERSITY

TEXAS A&M UNIVERSITY
A14838 430294

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by
TEXAS A&M UNIVERSITY

Original from
TEXAS A&M UNIVERSITY

Generated on 2025-01-07 00:14 GMT / https://hdl.handle.net/2027/txa.ark:/81423/m3rj2t
Public Domain / http://www.hathitrust.org/access_use#pd

Digitized by
TEXAS A&M UNIVERSITY

Original from
TEXAS A&M UNIVERSITY